The Effect of Patient Cost-sharing on Utilization, Health and Risk Protection

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Governments increasingly face an acute fiscal challenge of rising medical expenditures especially due to aging population and expansion of coverage. Spending growth for Medicare, the public health insurance program for the elderly in the United States, has continued unchecked in spite of a variety of government attempts to control costs.[1] As more than one third of current health spending is on the elderly, future cost control efforts can be expected to focus on seniors.[2]

One main strategy for the government to contain health care cost is cost-sharing, requiring patients to pay a share of the cost of care. However, cost-sharing has clear tradeoffs. While cost-sharing may reduce direct costs by decreasing moral hazard of health care services, it may also reduce access to beneficial and necessary health care that could mitigate future severe and costly health events. Moreover, very high levels of cost-sharing may undermine one of the primary reasons of having health insurance, which is financial protection from large out-of-pocket medical expenditure. Thus, there is a desperate need for knowledge on how cost-sharing affects utilization, health itself and risk protection, especially among the elderly, to determine the appropriate level of cost-sharing.

Credible evidence on the price sensitivity of health care consumption among the elderly is limited. For instance, individuals above age 62 were excluded from the well-known RAND Health Insurance Experiment (hereafter, RAND HIE), which randomly assigned individuals to insurance

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[1]Examples of supply-side attempts by the government to control cost are the introduction of prospective payment for hospitals and reductions in provider reimbursement rates (Cutler, 1998).

[2]The elderly are the most intensive consumers of health care. Patient over age 65 consume 36 percent of health care in the US despite representing only 13 percent of the population (Centers for Medicaid and Medicare Services, 2005). Furthermore, Medicare costs are expected to comprise over a quarter of the primary federal budget by 2035, or between five and six percent of GDP (CBO, 2011). Likewise, in Japan, the elderly consume five times as many health services as non-elderly (Okamura et al, 2005).

plans with different generosities. It is not clear *a priori* whether the elderly are expected to have a larger or smaller price elasticity of demand for health care services than the non-elderly. On one hand, the price elasticity for the elderly may be larger if they tend to be poorer or more credit-constrained than the non-elderly. On the other hand, it can be smaller if their health problems are more severe than those of non-elderly. An exception that studied the elderly is Chandra et al. (2010) who examined the effect of a small increase in the copayments for physician office visits and prescription drugs in a supplemental Medicare insurance policy.

Most U.S. studies, however, have difficulty separating the demand elasticities of patients from the responsive behavior by insurers and medical providers. This limitation arises because insurers prevent patients from freely choosing medical providers through managed-care, and medical providers determine which treatments to provide based on the patients' health insurance plans. Indeed, there is substantial evidence that the medical providers are reluctant to treat patients with government-funded health insurance beneficiaries due to low reimbursement rates as well as frequent delays in reimbursement.[3] If insurers and medical providers limit the patients' access to health care services, the elasticities of demand that are estimated in these studies could be biased.

By contrast, the unique setting in Japan permits isolation of the demand elasticity for health care services since medical providers and insurers typically play a small, if any, role in patients' demand for health care services. Under universal health insurance coverage in Japan, there are no restrictions on patients' choices of medical providers. Also physicians' payments are based on a national fee schedule that does *not* depend on patients' insurance type. This institutional setting limits physicians' incentives to influence patient demand and prevents cost-shifting, a well-known phenomenon in the U.S. where medical providers charge private insurers higher prices to offset losses from the beneficiaries of government-funded health insurance (Cutler, 1998).

My research design exploits a sharp reduction in patient cost-sharing at age 70 in Japan in a regression discontinuity design to compare the outcomes of those just below versus those just over age 70. Due to national policy, cost-sharing for outpatient visits and inpatient admissions is as much as 60-80 percent lower at age 70 than at age 69 in Japan. This reduction is substantial, especially for inpatient admissions: out-of-pocket medical expenditures for inpatient admissions can reach as much as 25 percent of the average annual income of a 69-year-old patient among those admitted. Since turning 70 in Japan does not coincide with changes in any other confounding factors such

[3]For example, see Cunningham and O'Malley (2009).

as employment or pension receipt, I can plausibly isolate the effect of the cost-sharing on demand for health care services.

This setting also offers additional advantages over previous empirical settings. While the change in co-payment in Chandra et al. (2010) is limited to office visits and prescription drugs, in Japan cost-sharing for inpatient admissions also changes abruptly at age 70. Thus I can estimate the elasticity of inpatient admissions of the elderly as well. Also, since I have detailed information on outpatient visits, I can investigate the price sensitivity of preventive care in the outpatient setting.[4] In contrast, most existing datasets capture either outpatient visits or inpatient admissions. In fact, the Agency for Healthcare Research and Quality (AHRQ) has recognized the need to develop a methodology for studying preventive care in an outpatient setting by using inpatient data to identify admissions that should not occur in the presence of sufficient preventive care (AHRQ, 2011). Finally, I examine the effect of cost-sharing on exposure to out-of-pocket medical expenditure risk. While there is a large literature on the impact of cost-sharing on health care utilization and health, there is remarkably little analysis of the impact of cost-sharing on expenditure risk, which is arguably the primary purpose of health insurance (e.g., Zeckhauser, 1970).[5]

I reach three conclusions. First, I find that reduced cost-sharing at age 70 discontinuously increases health care consumption. The corresponding elasticity is modest, around -0.2 for both outpatient visits and inpatient admissions. As it turns out, the elasticity I estimate is similar to the estimates found in the RAND HIE for the non-elderly, and slightly larger than that estimates for the elderly by Chandra et al. (2010) in the US. The finding indicates that the price elasticity of the elderly is similar in magnitude to that of the non-elderly. Examining patterns of utilization in more detail, I also find that lower cost-sharing is associated with increases in the number of patients presenting with both serious and non-serious diagnoses. For example, I find large increases in outpatient visits for diagnoses that are defined as Ambulatory Care Sensitive Conditions (ACSCs), for which proper and early treatment reduce subsequent avoidable admissions.

Second, on the benefit side, I do not find statistically significant improvements in health at age 70 at least in the short run. The lack of differences in overall as well as cause-specific mortality and self reported physical and mental health - in spite of utilization changes - imply that patient cost-sharing can reduce health care utilization without adversely affecting health.

Finally, I find that lower cost-sharing at age 70 yields reductions in out-of-pocket expenditures,

[4] Outpatient visits are visits to a clinic or hospital without being admitted.

[5] See Chandra et al. (2008) for an excellent summary of the past literature on cost-sharing and utilization.

since lower cost-sharing overwhelms increases in utilization. I then compute the gain in risk premiums through increased generosity in health insurance at age 70 by combining an expected utility framework with quantile RD estimates. Although somewhat speculative, my estimates suggest that the welfare gain of risk protection from lower cost-sharing is small for most, suggesting that the social cost of lower cost-sharing may outweigh the social benefit. Taken together, this study shows that increased cost-sharing may be achieved without decreasing total welfare.

This paper is related to an influential literature that examines Medicare eligibility at age 65 in a similar RD framework as this paper. Card et al. (2009) and Chay et al. (2010) show that Medicare eligibility has a modest positive effect on the health of those above age 65. However, these studies cannot definitely address whether these health improvements are the result of health insurance provision *per se* (extensive margin) or changes in health insurance generosity (intensive margin). This issue arises because turning age 65 in the US entails a number of coincident changes: transitions from private to public health insurance, increases in multiple coverage due to supplementary coverage (e.g., Medigap), and fewer gatekeeper restrictions due to the change from managed care to fee-for-services. Indeed, Card et al. (2009) conclude that it is not clear whether reductions in mortality are due to health insurance provision or generosity. In a companion paper, Card et al. (2008) show that both supply-side incentives and shifts in insurance characteristics play an important role for the utilization of health care services. In contrast, the change at age 70 only reflects increases in benefit generosity in my case.

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